

## Notes on the *Ceropales (Ceropales) maculata* group (Hymenoptera: Pompilidae) with description of a new species from China

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**Abstract:** A new species of the subgenus *Ceropales (Ceropales)* in the *maculata* group, *Ceropales (C.) longabdominalis* Jiang & Li sp. nov., is described and illustrated based on specimens collected in the north of China. A species checklist to the *C. (C.) maculata* group from China is provided, including a catalogue and distribution of a new record: *C. (C.) solskii* Radoszkowski, 1877 and 3 known species. A key to the species of the *C. (C.) maculata* group from China is provided.

**Key words:** *Ceropales longabdominalis*; taxonomy; spider wasps; key

中国盗蛛蜂亚属斑点盗蛛蜂种团研究及一新种记述（膜翅目：蛛蜂科）

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**摘要：**发现并描述采自中国北部的盗蛛蜂属盗蛛蜂亚属 *Ceropales (Ceropales)* 斑点盗蛛蜂种团 *maculata* group 1 新种：长腹盗蛛蜂 *Ceropales (C.) longabdominalis* Jiang & Li sp. nov.，记述了该种团 1 中国新纪录种：索氏盗蛛蜂 *Ceropales (C.) solskii* Radoszkowski, 1877，及中国已知种异名录及其分布，并编制了中国斑点盗蛛蜂种团种类检索表。

**关键词：**长腹盗蛛蜂；分类；蛛蜂；检索表

### Introduction

The *Ceropales (Ceropales) maculata* group was described in 1957 by Townes to include one species and four subspecies. In 1987, Móczár revised this group and provided a key to the species in this genus worldwide. Then, Loktionov and Lelej (2008) treated *C. rubripes* Móczár (1967) as a junior synonym of *C. erythropoda* Gussakovskij (1926). Currently the *maculata* group includes seven species and seven subspecies, which occur in the Palaearctic, Oriental, Nearctic and Afrotropical Regions. Three species in this group are known from China before this study (Móczár 1987).

The main characteristics of the *maculata* group are as follows: body usually black, with yellow or whitish spots and bands; more frequently metasoma with two lateral spots on tergum I, a band on tergum II posteriorly and only small streaks on terga V–VI medially; legs largely

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rufous-ferruginous, usually with black and yellow spots; wings rarely hyaline, usually greyish, often yellowish-golden or infuscate; antenna a little longer and more slender than in other species groups; mid tarsomere II about twice as long as width; inner margin of foretarsomere V (♂) with thumb-like lobe medially; claws of fore and mid tarsi each with a subapical tooth, except inner claw of male fore tarsus modified, with a large tooth basally; claw of hind tarsus rectangularly curved (Móczár 1987).

During our study of Chinese Pompilidae (Ma and Li 2011), one new species and one species newly recorded of the *maculata* group from China were discovered. This new species is described and illustrated. A key to the five known Chinese species of the *maculata* group is given below.

## Material and methods

The examined specimens are deposited in the Insect Collections of Yunnan Agricultural University (YNAU), Kunming, Yunnan Province, China, the Insect Collections of China Agricultural University (CAU), Beijing, China and the Institute of Zoology Chinese Academy of Sciences (IZB), Beijing, China. An Olympus stereomicroscope (SZ Series, Japan) with an ocular micrometer was used for this study. Photographs of the habitus were made with Keyence (VHX-H4M). Abbreviations are as follows: A1, A2...—antennal segment 1, 2...; HL—head length; HW—head width; OOD—ocelloocular distance; POD—postocellar distance.

## Taxonomy

### 1. *Ceropales (C.) erythropoda* Gussakovskij, 1926

*Ceropales erythropoda* Gussakovskij, 1926, *Revue Russe d'Entomologie*, 20: 253; Gussakovskij, 1931, *Ezhegodnik Zoologicheskago Muzeya*, 32: 7; Móczár, 1977, *Annales Historico-Naturales Musei Nationalis Hungarici*, 69: 256; Móczár, 1978, *Acta Universitatis Szegediensis Acta Biologica*, 24: 127; Móczár, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae*, 33: 139.

*Ceropales anderssoni* Haupt, 1938, *Arkiv för Zoologi*, 30: 14.

*Ceropales latitarsis* Haupt, 1938, *Arkiv för Zoologi*, 30: 13; Móczár, 1967, *Acta Zoologica Academiae Scientiarum Hungaricae*, 13: 385.

*Ceropales (Ceropales) sibiricus* Móczár, 1967, *Acta Zoologica Academiae Scientiarum Hungaricae*, 13: 386; Móczár, 1978, *Acta Universitatis Szegediensis Acta Biologica*, 24: 123.

**Specimens examined.** 6♀2♂, **China**, Heilongjiang, Haerbin, 45°47'39"N, 126°34'45"E, 04–25-VII-1955, coll. IZB; 1♀, Heilongjiang, Haerbin, 45°47'39"N, 126°34'45"E, 11-VI-1964, coll. IZB; 1♀, Heilongjiang, Haerbin, 45°47'39"N, 126°34'45"E, 25-VII-1955, coll. IZB; 1♂, Heilongjiang, Haerbin, 45°47'39"N, 126°34'45"E, 11-VII-1954, coll. IZB; 1♀1♂, Hebei, Weixian, Xiheyang, 39°56'30"N, 114°46'11"E, 06–11-VII-1964, coll. Yinheng HAN (IZB).

Distribution. China (Heilongjiang, Hebei); Mongolia; Russia; Turkey; Turkmenistan (Gussakovskij 1926; Móczár 1967; Móczár 1978; Móczár 1987).

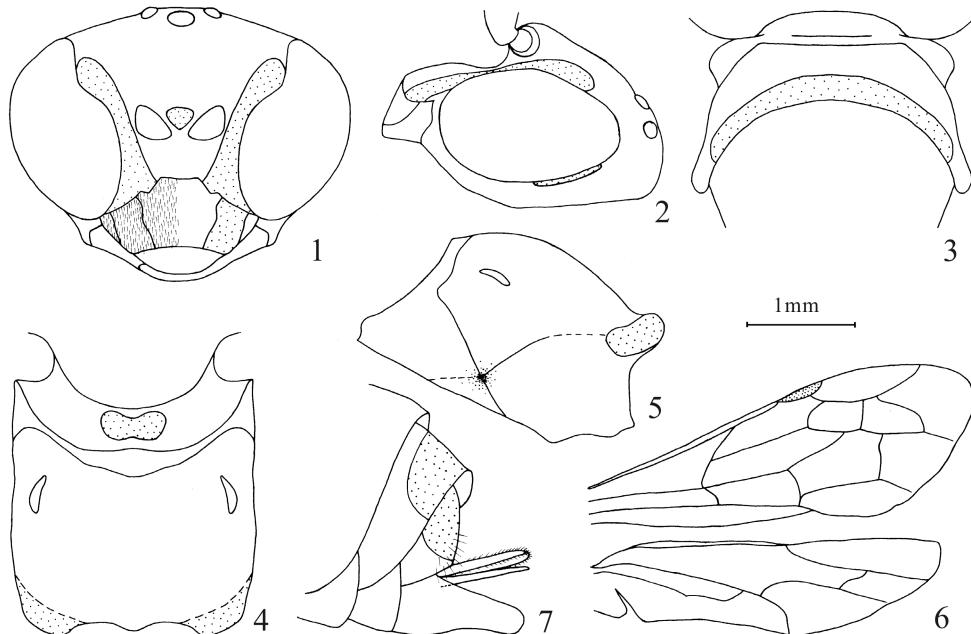
### 2. *Ceropales (C.) longabdominalis* Jiang & Li sp. nov. (Figs. 1–20)

Diagnosis. This species resembles *Ceropales (C.) magnifica* (Gussakovskij, 1926) in having large punctures on the pronotum, mesonotum and mesopleuron, but can be distinguished from that species and all other species of the genus by the following combination

of characters: clypeus without punctures, anterior margin slightly emarginate medially; pronotum without fine, longitudinal rugae; scutellum without dense, slender longitudinal rugae posteriorly; lateral surface of propodeum with scattered large punctures; metapleuron without large punctures; mid tarsomere II about 3x as long as wide ( $\varphi$ ); sternum VI conspicuously long, in lateral view ventral surface sinuate, remarkably convex at basal half ( $\varphi$ ) (Fig. 7); pronotum laterally yellowish-brown.

Description. Female (Figs. 1–7). Body length 8–12 mm; head and mesosoma dull, coarsely alutaceous; metasoma slightly shiny.

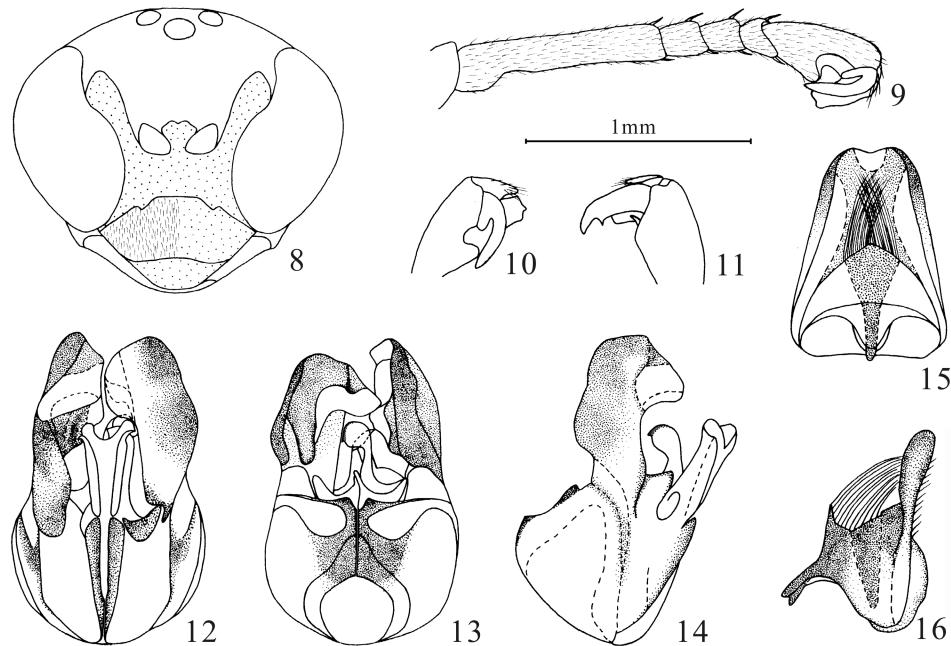
Head. Clypeus slightly convex; anterior margin nearly truncate, slightly emarginate medially (Fig. 1). Labrum exposed. Mandible apically bidentate. Lower frons slightly concave; area between antennal socket conspicuously elevated (Fig. 2). Frontal line shallow, extending to median frons. Upper frons sinuate before ocellus in profile (Fig. 2). Frons and vertex with adjacent, small punctures mixed with sparse, large punctures. Gena with several small punctures dorsally. Ratio of HW : HL = 80 : 38; POD : OOD = 16 : 24; relative length in dorsal view of A1, A2, A3, A4, A5, A6, A11, A12 = 24, 12, 25, 25, 25, 25, 22, 30.



Figures 1–7. *Ceropales (C.) longabdominalis* Jiang & Li sp. nov.,  $\varphi$ . 1. Head, frontal view; 2. Head, lateral view; 3. Pronotum, dorsal view; 4. Metapostnotum and propodeum, dorsal view; 5. Propodeal enclosure, lateral view; 6. Fore and hind wings; 7. Metasomal sterna IV–VI, lateral view. Scale bars = 1.0 mm (Figs. 1–5, 7); 0.45 mm (Fig. 6).

Mesosoma. Pronotum with dense, large punctures; anterolateral angle tuberculate, with inconspicuous rugae on each side; posterolateral angle rounded; lower angle of anterior margin acute; posterior and lateral areas semitransparent; posterior margin arcuate (Fig. 3). Mesonotum with dense, large punctures 0–1  $\times$  diameters apart; prescutal suture about 1/6

times as long as mesonotum; parapsidal line about 2/3 times as long as mesonotum; lateral margin semitransparent. Mesopleuron with large punctures, densely on upper area, sparsely on lower area; posterior margin with sturdy, short, longitudinal ridges. Scutellum with prescutellar sulcus; median area conspicuously elevated and with dense, large punctures; posterior area with short, longitudinal median groove, or absent on some specimens. Metanotum elevated medially, slightly concave at apex, with sparse, oblique, longitudinal rugae laterally. Postnotum with irregular longitudinal rugae; anterior and posterior margins nearly parallel laterally; medial area broadened to propodeum in angle (Fig. 4). Anterior margin of propodeum slightly concave (Fig. 4); dorsal surface of propodeum convex at about 1/3 length in lateral view (Fig. 5), with scattered, large punctures and irregular, sparse, transverse striae; posterior propodeum relatively flat, elevated medially, slightly concave laterally, with irregular, dense, longitudinal rugae largely, and dense, slender, transverse striae posteriorly, semicircular elevated medially; posterolateral angle of propodeum trapezoidal shaped elevated (Fig. 4); lateral surface of propodeum with scattered large punctures. Metapleuron with inconspicuous, slender, oblique, longitudinal rugae.



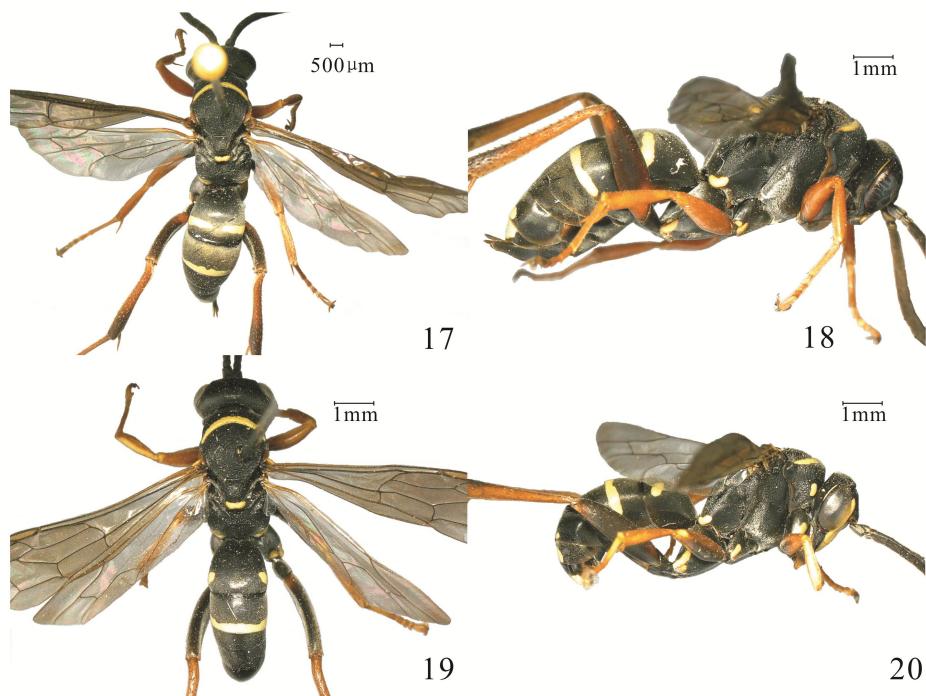
Figures 8–16. *Ceropales* (*C.*) *longabdominalis* Jiang & Li sp. nov., ♂. 8. Head, frontal view; 9. Fore tarsus; 10. Fore inner claw; 11. Fore outer claw; 12. Male genitalia, dorsal view; 13. Male genitalia, ventral view; 14. Male genitalia, lateral view; 15. Sternal IX, ventral view; 16. Sternal IX, lateral view. Scale bars = 2.0 mm (Fig. 8); 0.89 mm (Figs. 9, 12–14); 1.0 mm (Figs. 10, 11, 15, 16).

Legs. Fore tarsomeres II–IV normal; mid tarsomere II about 3 × as long as wide; spur on hind tibia with setae to inner side, basal half of hind tarsomere I with setae, tarsomere V with spine apically; fore tarsal claws normal; claws of fore and mid tarsi with tooth subapically; claws of hind tarsus rectangularly curved.

Wings. Fore wing with 3 submarginal cells; upper submarginal cell III obviously shorter than upper submarginal cell II, lower submarginal cell III obviously longer than lower submarginal cell II; submarginal cell II receiving recurrent vein I at apical 1/3; submarginal cell III receiving recurrent vein II medial or basal 1/3. Vein M + CuA of hind wing diverging after cu-a (Fig. 6).

Metasoma not petiolate, fusiform; tergum II with transverse furrow basally, alutaceous, shiny or slightly shiny basally; sternum VI conspicuous long, strongly compressed, in lateral view ventral surface sinuate, remarkable convex basally, rounded apically (Fig. 7).

Color. Black; apical half of mandible reddish brown to dark brown; free margin of labrum, broad band from anterior margin of clypeus to depression of inner orbit (Fig. 1), narrow band along upper outer orbits (Fig. 2), subtriangular spot between two antennal sockets (Fig. 1), irregular large spot on scape beneath, small spot on pedicel beneath, spot on tuberculate prominence of pronotum anterolaterally (some specimens black), band on pronotum posteriorly, spot on metanotum medially, spot on angle of propodeum posterolaterally (Fig. 4), two lateral spots on metasomal tergum I, bands on terga II and IV posteriorly, small bands on terga V–VI medially and coxa dorsoapically yellow; femur, tibia and tarsus reddish brown, femur sometimes black; lateral margin of pronotum and tegula yellowish brown. Wings hyaline, brownish, veins dark brown.



Figures 17–20. *Ceropales (C.) longabdominalis* Jiang & Li sp. nov. 17, 18. ♀; 19, 20. ♂. 17, 19. Habitus, dorsal view; 18, 20. Habitus, lateral view.

Seta. Body with short seta; clypeus, around tegula, scutellum, metanotum and propodeum with dense, short, white seta.

Male (Figs. 8–16). Differs from female as follows: lower face entirely yellow (Fig. 8), trochanter apically sometimes yellow; ratio of HW : HL = 78 : 37; POD : OOD = 14 : 20; relative length in dorsal view of A1, A2, A3, A4, A5, A6, A12, A13 = 20, 10, 25, 25, 25, 20, 25; fore tarsomeres II–IV shortened, inner margin of fore tarsomere V with a thumb-like lobe medially (Fig. 9); mid tarsomere II about twice as long as width; inner claw of fore tarsus modified, with a large tooth basally (Figs. 10–11); metasomal sternum VII normal. Male genitalia (Figs. 12–16).

**Holotype.** ♀, China, Inner Mongolia, Helan Mountain National Nature Reserve, 38°57'4"N, 105°53'3"E, 27-VII-2010, coll. Dingjie ZHANG *et al.* (YNAU); **Paratypes.** 1♀, China, Liaoning, Shenyang National Forest Park, 42°02'45"N, 123°42'57"E, 15-VII-2011, coll. Rui ZHANG (YNAU); 1♀, China, Beijing, Heishanzhai, 40°21'23"N, 116°18'7"E, 02-IX-2009, coll. Yuyu WANG (CAU); 1♀, China, Inner Mongolia, Liangcheng, Daihai, 40°33'27"N, 112°35'22"E, 06-IX-2013, coll. Li JIANG (YNAU); 1♂, China, Inner Mongolia, Helan Mountain, Zhonggutian, 39°01'37"N, 106°02'44"E, 03-VIII-2010, coll. Fangzhou MA (YNAU); 1♀, China, Inner Mongolia, Helan Mountain, Shuimogou, Beigou, 38°57'31"N, 105°52'48"E, 28-VII-2010, coll. Fangzhou MA (YNAU); 3♂, China, Inner Mongolia, Helan Mountain National Nature Reserve, 38°57'4"N, 105°53'3"E, 27-VII-2010, coll. Dingjie ZHANG *et al.* (YNAU); 1♂, China, Inner Mongolia, Helan Mountain National Nature Reserve, 38°57'4"N, 105°53'3"E, 27-VII-2010, coll. Dingjie ZHANG *et al.* (YNAU); 1♂, China, Inner Mongolia, Helan Mountain National Nature Reserve, 38°57'4"N, 105°53'3"E, 27-VII-2010, coll. Dingjie ZHANG *et al.* (YNAU); 2♀, China, Inner Mongolia, Helan Mountain, Shuimogou, Zhenggou, 38°56'29"N, 105°53'16"E, 31-VII-2010, coll. Dingjie ZHANG (YNAU); 2♂, China, Inner Mongolia, Helan Mountain, Shuimogou, Nangou, 38°56'45"N, 105°52'33"E, 26-VII-2010, coll. Fangzhou MA (YNAU); 1♀, China, Shanxi, Ganquan, Qingquandong, 36°16'30"N, 109°30'29"E, 04-IX-1971, coll. Jikun YANG (CAU). All type specimens are deposited in the Entomological Museum of China Agricultural University, Beijing, China and the Insect Collections of Yunnan Agricultural University (YNAU), Kunming, Yunnan Province, China.

**Distribution.** China (Inner Mongolia, Beijing, Liaoning, Shanxi).

**Etymology.** The specific epithet *longabdominalis* is derived from Latin word *longus* (long), and *abdominalis* (abdominal), with reference to sternum VI being conspicuously long.

### 3. *Ceropales* (*C.*) *maculata* (Fabricius, 1775)

*Ceropales maculata* Fabricius, 1775, Systema Entomologiae Sistens Insectorvm Classes, Ordines, Genera, Species, Adiectis Synonymis, Locis, Descriptionibvs, Observationibvs: 345; Dalla Torre, 1895, *Wiener Entomologische Zeitung*, 14: 91; Gussakovskij, 1931, *Ezhegodnik Zoologicheskago Muzeya*, 32: 21; Townes, 1957, *Bulletin of the United States National Museum*, 209: 241; Móczár, 1967, *Acta Zoologica Academiae Scientiarum Hungaricae*, 13: 393; Day, 1979, *Bulletin of the British Museum (Natural History), Entomological Series*, 38: 20.

**Specimens examined.** 1♂, China, Xinjiang, Qinghe, 46°40'27"N, 90°23'22"E, 01-VIII-1955, coll. Yawen YANG (IZB); 1♂, China, Heilongjiang, Haerbin, 45°47'39"N 126°34'45"E, 16-VII-1955, coll. IZB; 1♂, China, Inner Mongolia, Helan Mountain, Halawugou, Shatangzi, 38°51'59"N, 105°54'34"E, 08-VIII-2010, coll. Dingjie ZHANG (YNAU); 5♂, China, Inner Mongolia, Helan Mountain, Yaoba, 38°31'55"N, 105°36'12"E, VIII-2010, coll. Dingjie ZHANG (YNAU).

Distribution. China (Inner Mongolia, Xinjiang, Heilongjiang); Afghanistan; Algeria; Azerbaijan; Cyprus; Europe; Iran; Japan; Mongolia; Russia; South Korea; Syria; the United States; Turkey; Turkmenistan; Uzbekistan (Gussakovskij 1931; Townes 1957; Móczár 1967; Móczár 1987).

#### 4. *Ceropales (C.) magnifica* Gussakovskij, 1926

*Ceropales magnifica* Gussakovskij, 1926, *Revue Russe d'Entomologie*, 20: 252; Gussakovskij, 1931, *Ezhegodnik Zoologicheskago Muzeya*, 32: 22; Móczár, 1978, *Acta Universitatis Szegediensis Acta Biologica*, 24: 122; Móczár, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae*, 33: 139.

**Specimens examined.** 8♀2♂, **China**, Heilongjiang, Haerbin, 45°47'39"N, 126°34'45"E, 04–19-VII-1955, Coll. IZB; 1♀, Heilongjiang, Haerbin, 45°47'39"N, 126°34'45"E, 09-VIII-1955, coll. IZB; 1♂, Shanxi, Taigu, 37°25'1"N, 112°34'31"E, 27-VIII-1953, coll. IZB.

Distribution. China (the northeast, Shanxi); Russia (Gussakovskij 1926; Móczár 1987).

#### 5. *Ceropales (C.) solskii* Radoszkowski, 1877, new record to China

*Ceropales solskii* Radoszkowski, 1877, *Izvestiya Imperatorskogo Obshchestva Lyubiteley Estestvoznanija, Antropologii i Étnografii pri Imperatorskom Moskovskom Universitete*: 13; Dalla Torre, 1895, *Wiener Entomologische Zeitung*, 14: 92; Móczár, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae*, 33: 140.

*Ceropales solskyi*: Gussakovskij, 1926, *Revue Russe d'Entomologie*, 20: 252; Gussakovskij, 1931, *Ezhegodnik Zoologicheskago Muzeya*, 32: 6; Móczár, 1978, *Acta Universitatis Szegediensis Acta Biologica*, 24: 126.

**Specimens examined.** 1♀, **China**, Heilongjiang, Haerbin, 45°47'39"N, 126°34'45"E, 19-VII-1955, coll. IZB; 1♀, China, Inner Mongolia, Liangcheng, Daihai, 40°33'27"N 112°35'22"E, 06-IX-2013, coll. Li JIANG (YNAU); 1♀, China, Inner Mongolia, Liangcheng, Daihai, 40°33'27"N, 112°35'22"E, 07-IX-2013, coll. Jian ZHU (YNAU).

Distribution. China (Inner Mongolia, Heilongjiang); Uzbekistan; Tajikistan (Radoszkowski 1877; Gussakovskij 1931; Móczár 1978).

#### Key to species of the *maculata* group from China

1. Frons with adjacent, small punctures and few large punctures only between ocelli and eye; punctures of mesopleuron 2 × diameters apart..... 2
- . Frons with adjacent, small punctures and scattered large punctures; punctures of mesopleuron 1 × diameters apart below tegulae..... 3
2. Propodeum with longitudinal furrow medially, with transverse furrow basally, posterolateral angle rounded..... *C. (C.) maculata* Fabricius
- . Propodeum without longitudinal furrow medially, relatively polished basally, posterolateral angle trapezoidal shaped..... *C. (C.) erythropoda* Gussakovskij
3. Propodeum coarsely rugose; metasomal tergum III black without yellow spot (♂)..... 4
- . Propodeum at most finely rugose basally; metasomal tergum III black with a trace of small yellow spot (♂)..... *C. (C.) solskii* Radoszkowski
4. Sternum VI conspicuously long, in lateral view ventral margin sinuate (♀); clypeus without punctures; metapleuron without large puncture..... *C. (C.) longabdominalis* Jiang & Li
- . Sternum VI normal, in lateral view ventral margin flat (♀); clypeus with scattered punctures; metapleuron with dense large punctures medially..... *C. (C.) magnifica* Gussakovskij

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